



What We Experienced up in the Northwest on that Hot Monday

Birgit Koehler

Bonneville Power Administration

Power Schedule Planning



Hydro System Heavily Constrained in Summer

- 70% of BPA power is hydroelectric, 50% of regional firm power is hydroelectric
- In summer flows decrease and water supply is significantly more limiting than turbine capacity
- Numerous constraints on operations, notably: required spill and reduced forebay operating ranges to assist migrating salmon (endangered and prized species)



NW Regional Picture for July 24

- NWPP region (incl. Canada) 8° above normal Monday.
BPA control area 12.9° above normal Monday (14°-15.6° Friday - Sunday).
- NWPP estimates 2,400 MW of weather-induced load above normal.
- 8 Unit forced outages included Colstrip #4 (778 MW) tripped out for 4-6 hours, back slowly, out again. Elsewhere lightning strikes caused transmission outage.
- 6 control areas were in emergency status. At least 4 NERC Alerts.

	EEA 1	EEA2	EEA3
PGE	17:31 – 19:31	11:41 – 17:31	
PAC	16:10 – 17:10	14:16 – 16:10	
AESO	08:15 – 10:10	10:10 – 15:33	15:33 – 16:25
PSE	14:14 – 20:00		



Intertie Loadings over Peak Hours

- AC N → S
 - Six-hour average **4030 MW** (HE 13 to HE 18)
 - Limited by loop flow (and by two cutplanes at northern end that were around OTC limits)
- DC N → S
 - Six-hour average **2437 MW**
 - Limited by two cutplanes at northern end that were around OTC limits
- BC → NW
 - Six-hour average **2017 MW**
 - OTC limited



Coordination Efforts

- CAISO
 - Phoned on Friday, Sunday, and Monday to discuss CA and NW outlooks
- Hydro Project Owners
 - Worked with Corps of Engineers and Bureau of Reclamation to request extra flexibility
- Department of Justice
 - Appraised DOJ of power outlook and actions we might need to take on river operations impacting court-ordered spill for Salmon recovery.
- [NW Salmon] Technical Management Team
 - Appraised them of power outlook and actions we might need to take that impact fish operations



Preparatory Actions

- River/Generation (1500-2000 MW)
 - Secured permission to exceed some river operating constraints
 - Filled smaller reservoirs and increased generation upstream Sunday to maximize water (reservoirs and inflow) on Monday
 - Returned all available generation units to service and rescheduled some outages
 - Filled pump/storage project for Monday generation
 - Rearranged some salmon recovery operations (flow and spill requirements)
- Transmission
 - Recalculated limits to more closely model current conditions – to provide maximum flexibility for hydro generation
 - Rescheduled some maintenance outages



Additional Actions BPA would have taken for a Stage 3 Emergency

- Short-term deviations from salmon-recovery operations (as a last resort).
 - We have many system constraints through “Biological Opinion” (ESA) and court order
 - Needed letter from CAISO specifying “risk to health and safety” to deviate
 - BPA coordinated with CAISO, DOJ, and Salmon TMT team Friday and Monday morning to expedite process in case CA reached Stage 3



Lessons Learned

- Coordination was crucial. Do early.
- Advanced preparations for River (Gen) and TX saved our hide.
- Need common standards for emergency declaration.